

CLAIMS

1. A personal hair removal device comprising:
- a substrate;
 - a plurality of blades connected to said substrate, each of said blades comprising at least one cutting edge with a radius of curvature not greater than about 1000 angstroms.
2. A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 500 angstroms.
3. A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 250 angstroms.
4. A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 75 angstroms.
5. A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 50 angstroms.
6. A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 30 angstroms.

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7. A hair removal device according to claim 1 wherein said radius of curvature is not greater than about 10 angstroms.
 8. A hair removal device according to claim 1 comprising at least about 10 blades.
 9. A hair removal device according to claim 1 comprising at least about 50 blades.
 10. A hair removal device according to claim 1 comprising at least about 100 blades.
 11. A hair removal device according to claim 1 comprising at least about 200 blades.
 12. A hair removal device according to claim 1 comprising at least about 500 blades.
 13. A hair removal device according to claim 1 comprising at least about 1000 blades.

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14. A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 1000 microns.
15. A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 500 microns.
16. A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 250 microns.
17. A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 100 microns.
18. A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 75 microns.
19. A hair removal device according to claim 1 wherein said blades comprise a cutting depth of not greater than about 50 microns.

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20. A hair removal device according to claim 1 wherein said cutting edges are straight.
21. A hair removal device according to claim 1 wherein said cutting edges are serrated.
22. A hair removal device according to claim 1 wherein said cutting edges are curved.
23. A hair removal device according to claim 1 wherein a plurality of said blades are mounted on separate blade supports.
24. A hair removal device according to claim 1 wherein said blades are arranged in ordered columns and rows on said substrate.
25. A hair removal device according to claim 1 wherein said blades are arranged in staggered columns and rows on said substrate.
26. A hair removal device according to claim 1 further comprising at least one guard element comprising a skin engaging surface.

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27. A hair removal device according to claim 1 further comprising a plurality of guard elements each comprising at least one skin engaging surface.
 28. A hair removal device according to claim 26 wherein said guard element is formed of a resilient material.
 29. A hair removal device according to claim 27 wherein at least some of said guard elements are disposed between some of said blades.
 30. A hair removal device according to claim 1 wherein at least some of said cutting edges are oriented in different directions.
 31. A hair removal device according to claim 1 wherein at least some of said cutting edges are oriented in at least two different directions which are angled at least about 90° to each other.
 32. A hair removal device according to claim 1 wherein said substrate is flexible.

33. A hair removal device comprising:

a substrate;

a plurality of blades connected to said substrate, wherein said blades comprise a cutting depth of not greater than about 1000 microns.

34. A hair removal device according to claim 33 wherein said cutting depth is not greater than about 500 microns.

35. A hair removal device according to claim 33 wherein said cutting depth is not greater than about 250 microns.

36. A hair removal device according to claim 33 wherein said cutting depth is not greater than about 100 microns.

37. A hair removal device according to claim 33 wherein said cutting depth is not greater than about 75 microns.

38. A hair removal device according to claim 33 wherein said cutting depth is not greater than about 50 microns.

39. A hair removal device according to claim 33 comprising at least 10 blades.

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40. A hair removal device according to claim 33 comprising at least about 50 blades.
41. A hair removal device according to claim 33 comprising at least about 100 blades.
42. A hair removal device according to claim 33 comprising at least about 200 blades.
43. A hair removal device according to claim 33 comprising at least about 500 blades.
44. A hair removal device according to claim 33 comprising at least about 1000 blades.
45. A hair removal device according to claim 33 wherein said blades comprise a radii of curvature not greater than about 1000 angstroms.
46. A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 500 angstroms.

47. A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 250 angstroms.
48. A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 100 angstroms.
49. A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 50 angstroms.
50. A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 30 angstroms.
51. A hair removal device according to claim 33 wherein said radii of curvature is not greater than about 10 angstroms.
52. A hair removal device according to claim 33 wherein said cutting edges are straight.
53. A hair removal device according to claim 33 wherein said cutting edges are serrated.
54. A hair removal device according to claim 33 wherein said cutting edges are curved.

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55. A hair removal device according to claim 33 wherein said blades are mounted on separate blade supports.
56. A hair removal device according to claim 33 wherein said blades are arranged in ordered columns and rows on said substrate.
57. A hair removal device according to claim 33 wherein said blades are arranged in staggered columns and rows on said substrate.
58. A hair removal device according to claim 33 further comprising at least one guard element comprising a skin engaging surface.
59. A hair removal device according to claim 33 further comprising a plurality of guard elements each comprising at least one skin engaging surface.
60. A hair removal device according to claim 33 wherein at least some of said guard elements are disposed between some of said blades.

61. A hair removal device according to claim 33 wherein at least some of said cutting edges are oriented in different directions.

62. A hair removal device according to claim 33 wherein said substrate is flexible.

63. A hair removal device according to claim 33 wherein at least some of said cutting edges are oriented in at least two different directions which are angled at least about 90°.

64. A hair removal device comprising:
a substrate;
at least 10 micro-blades connected to said substrate.

65. A hair removal device according to claim 64 comprising at least about 50 of said micro-blades.

66. A hair removal device according to claim 64 comprising at least about 100 of said micro-blades.

67. A hair removal device according to claim 64 comprising at least about 200 of said micro-blades.

68. A hair removal device according to claim 64 comprising at least about 500 of said micro-blades.

69. A hair removal device according to claim 64 comprising at least about 1000 of said micro-blades.

70. A hair removal device according to claim 64 wherein said blades comprise a radii of curvature not greater than about 1000 angstroms.

71. A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 500 angstroms.

72. A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 250 angstroms.

73. A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 100 angstroms.

74. A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 50 angstroms.

75. A hair removal device according to claim 64 wherein said radii of curvature is not greater than about 10 angstroms.
76. A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 1000 microns.
77. A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 500 microns.
78. A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 250 microns.
79. A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 100 microns.
80. A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 75 microns.

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81. A hair removal device according to claim 64 wherein said blades comprise a cutting depth of not greater than about 50 microns.
82. A hair removal device according to claim 64 wherein said cutting edges are straight.
83. A hair removal device according to claim 64 wherein said cutting edges are serrated.
84. A hair removal device according to claim 64 wherein said cutting edges are curved.
- (85). A hair removal device according to claim 64 wherein said blades are each mounted on separate blade supports.
- (86). A hair removal device according to claim 64 wherein said blades are arranged in ordered columns and rows on said substrate.
- (87). A hair removal device according to claim 64 wherein said blades are arranged in staggered columns and rows on said substrate.

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94. A hair removal device comprising:

a substrate;

at least about 100 micro abrasive elements connected to said substrate.

95. A hair removal device according to claim 94 wherein said substrate is flexible.

96. A method of making a personal hair removal device comprising the steps of:

providing a substrate;

depositing a thin film of at least one etchable material on said substrate; and

etching a plurality of cutting edges in said deposited film.

97. A method of making a personal hair removal device according to claim 96 wherein said etching step also comprises etching blade supports.

98. A method of making a personal hair removal device according to claim 96 wherein said etching steps also comprises etching skin engaging elements which do not have sharp edges.

99. A method of making a personal hair removal device according to claim 96 further comprising the step of creating a pattern on said deposited film prior to said etching step.
100. A method of making a personal hair removal device according to claim 99 wherein said pattern is created by photolithography.
101. A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises providing a flexible substrate.
102. A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises polyimide.
103. A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises polyetheretherketone (PEEK).
104. A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises providing a flexible substrate having a thickness of about 0.05 mm to about 2 mm.

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105. A method of making a personal hair removal device according to claim 96 wherein said step of providing a substrate comprises providing a flexible substrate having a thickness of about 0.1 mm to about 0.5 mm.
106. A method of making a personal hair removal device according to claim 96 wherein said step of depositing a thin film of etchable material comprises depositing a material selected from the group consisting of tungsten, tantalum nitride, boron nitride, diamond, and combinations thereof.
107. A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing chemical vapor deposition.
108. A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing plasma assisted chemical vapor deposition.
109. A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing electron cyclotron resonance deposition.

110. A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing sputter deposition.

111. A method of making a personal hair removal device according to claim 96 wherein said depositing step is performed utilizing radio frequency assisted deposition.

112. A method of making a personal hair removal device according to claim 96 wherein said etching step comprises sputtering.

113. A method of making a personal hair removal device according to claim 96 wherein said etching step comprises reactive ion etching.

114. A method of making a personal hair removal device according to claim 96 wherein said etching step comprises ion milling.

115. A method of making a personal hair removal device according to claim 96 wherein said etching step comprises wet chemical etching